BatLab Basic Project Kit - HC-SR04 Ultrasonic Distance Sensor

HOW IT WORKS

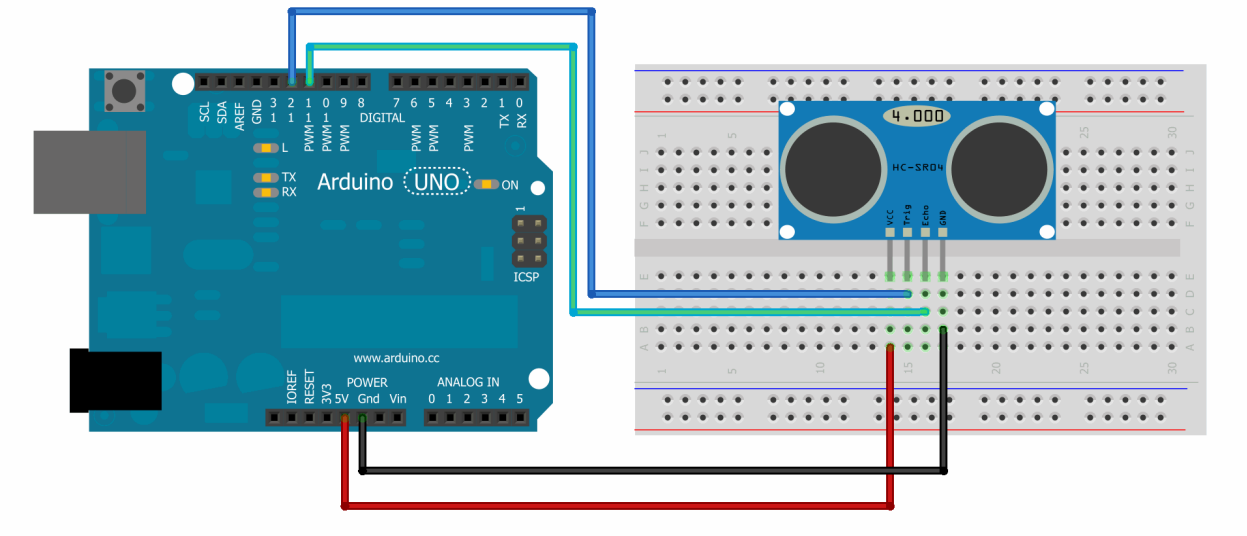
The HC-SR04 detects the distance of the closest object in front of the sensor (from 2 cm up to 3m). It works by sending out a burst of ultrasound and listening for the echo when it bounces or "pings" off of an object. The Arduino board sends a short pulse to trigger the detection, then listens for a pulse on the echo pin. The duration of this second pulse is equal to the time taken by the ultrasound to travel to the object and back to the sensor. Using the speed of sound, this time can be converted to distance.

This sensor is often used for obstacle avoidance in autonomous robots.

PARTS

- Arduino Uno
- HC-SR04 Ultrasonic Distance Sensor
- Breadboard & jumper wires

CIRCUIT



CODE

```
 /* BatLab Basic Project Kit

HC-SR04 Ultrasonic Distance Sensor example

Download the NewPing library here and install it using these instructions: Importing a .zip library


For more information on the NewPing library, visit:
http://playground.arduino.cc/Code/NewPing

Hardware connections:

      Connect ECHO pin to Arduino digital pin 11.
      Connect TRIG pin to Arduino digital pin 12.
      Connect VCC to Arduino 5V.
      Connect GND to Arduino GND.

Open the serial monitor to see the distance to the nearest object.

*/


#include <NewPing.h>          //uses the NewPing library to do the work

const int TRIGGER_PIN = 12;
const int ECHO_PIN = 11;
const int MAX_DISTANCE = 200;   // maximum distance in cm to read


// Create an object called "sonar" of type "NewPing"
NewPing sonar(TRIGGER_PIN, ECHO_PIN, MAX_DISTANCE);

void setup()
{

// Opens communications with the serial monitor; be sure to
// set the speed to 115200 in the monitor window, too (at lower right)
// If the speeds don't match, you'll just get garbage on the screen

  Serial.begin(115200);
 }

void loop()

{
  delay(50);
  int uS = sonar.ping();  // returns value in microseconds
  Serial.print("Ping: ");
  Serial.print(uS / US_ROUNDTRIP_CM); //prints distance in cm
  Serial.println("cm");
}
```